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## PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

## Improvements relating to the Production of Sound Records

We, Dr. FRANZ NEUMANN, of Mommensenstrasse 47, Berlin-Charlottenburg, Germany, and ALOYS DENGLE, of Ritterstrasse 71, Berlin, S.W. 68, Germany, both German citizens, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention relates to sound records of sheet form, provided with sound track layers on their outer surfaces, which sheets are pressed together, with the inter-position of a mass of stiffening binding material, to impress the grooves in their sound track layers. In an improved process according to the invention, by the use of suitable dies or tools in the press a peripheral rim completely enclosing the periphery of the carriers and that of the sound track layers is formed during the pressing process by the material of the mass of stiffening binding material which is pressed outwardly.

A sound record in accordance with the invention comprises sound track carrier sheets, held together by a stiffening binding mass which is formed integrally with a peripheral rim of the record which encloses the edges of the carriers and of the sound track layers.

The fact that the rim encloses the outside-edges of the actual carriers and sound track layers is the feature of vital importance since it prevents penetration of moisture and other damage to the edges of the three materials employed and the joints between them, which are covered and protected by the hard set edging of stiffened binding material.

The choice of the actual sound track layer and of the carrier of this layer is absolutely unlimited, so that all requirements can be fulfilled which must be placed individually upon such materials according to the purposes for which the record is to be used.

It is apparent that, when using a process in accordance with the invention, the materials to be employed can be chosen within wide limits and precise exactitude of adjustment of the matrix surface and

the lower press surface is unnecessary, since during the impression itself the squeezing out of a cushion-like intermediate layer provides for the necessary equalization, through which an exact impression of the sound grooves is made possible.

The nature of the invention will be made clear by a description of a particular example, reference being made to the accompanying drawings, in which:

Figure 1 is a vertical section through a record, and

Figure 2 is part of a similar section through a modified form of record.

A sound track carrier *a* is provided on one side with a layer *b* capable of taking an impression, for example, of cellulose lacquer, resin lacquer or the like, and of a depth sufficient for the reception of the sound grooves. The choice of the preferably lacquer-like mass for the actual sound track layer *b* is open; in general, however, lacquers of cellulose esters will probably be used. Even so, the choice of the carrying layer *a* is open, and this can consist of fibrous materials such as paper, cardboard and the like, or of textile fabrics, metal foils, etc. It is an advantage of the process that the thickness of this carrying layer *a* can be very small, but that in general the resistance to tearing should be so great that, even in the case of fracture of the rigid materials, the holding together of the record can be ensured by these carrying layers.

The surface *c* of the carrying layer *a* opposed to the sound track layer *b* can in a given case be provided with an adhesive which is necessary in certain circumstances, according to whether the material producing the rigidity of the record possesses itself more or less sufficient adhesive properties with regard to the material of the carrying layer.

The two carrier layers *a* and *a'* are produced from the same or similar materials or even from quite different materials, with the relatively thin sound track layers *b* and *b'* and perhaps with layers *c* and *c'* of adhesive material. A carrier layer *a'* is now placed with the sound track side *b'* upon the press plate *d* which is pro-

vided with an impression plate, a stiffening binding mass *e* of any desired material, for example, shellac-like masses with fillers, is applied to the side *c*<sup>1</sup> of the layer, which is either free or provided with an adhesive, and the carrying layer *a* is laid upon this binding mass, with the free or adhesive surface *c* downward.

The pressing can now be effected, and at the same time the sound grooves are impressed in the surfaces *b* and *b*<sup>1</sup>. The stiffening binding mass *e* spreads in all directions during the pressing, perhaps with the application of heat, and forms an outer peripheral rim *f* enclosing the edges of the carriers *a* and *a*<sup>1</sup> and of the sound-track layers *b* and *b*<sup>1</sup> according to the nature of the tools or dies used in the press. During the actual pressing this pliant connecting mass *e* or *f* acts as an equalizing cushion to equalize any disparity in the horizontal positions of the base plate *d* and the upper matrix in order to obtain a complete impression of the sound track.

By such a process rigid and yet unbreakable sound records may be produced provided with transparent sound track masses. Since, as mentioned above, the carrying layers *a* and *a*<sup>1</sup> can be of comparatively thin paper, which may be easily printed, and the lacquer layers thinner still, especially good results can be obtained in the way of pictures which are visible through the sound track. The stiffening binding mass *e* can also be provided internally with a reinforcing layer *g* of any suitable material, as indicated by dotted lines in Figure 1.

In the form according to Figure 2, the peripheral rim of the mass *e* of binding material projects materially beyond the surface of the playing layer *b* or *b*<sup>1</sup>, as at *h*, forming a rim which projects the playing layer against damage for example by scratching, when the records are stacked during transport or storage.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to

be performed, we declare that what we claim is:—

1. A process for the production of sound records by impressing sound tracks in layers carried by sound track carriers of sheet form, between which a mass of stiffening binding material is interposed, in which during the pressing operation for producing the sound grooves, by the use of suitable dies or tools a peripheral rim completely enclosing the periphery of the carriers and that of the sound track layers is formed by the material pressed out from the stiffening binding mass, which rim is allowed to harden to protect the edges of the layers of the three materials employed and the joints between them.

2. A sound record comprising sound track carrier sheets held together by a stiffening binding mass and a peripheral rim formed integrally with the stiffening binding mass and enclosing the edges of the carriers and those of the sound track layers.

3. A sound record as claimed in Claim 2 in which the peripheral rim formed integrally with the stiffening binding mass projects beyond the faces of the sound track layers.

4. A sound record as claimed in either of Claims 2 or 3 in which the peripheral rim encloses further strengthening reinforcement embedded in the binding material.

5. A sound record as claimed in any of Claims 2, 3 or 4 in which adhesive is interposed between the carriers and the stiffening binding mass.

6. A process for making sound records substantially as described.

7. A sound record substantially as described with reference to the accompanying drawings.

Dated the 24th day of April, 1936.

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[This Drawing is a reproduction of the Original on a reduced scale.]

